

Serial No. 09/942,323

IN THE CLAIMS:

Claims 12, 24, 25, 29, 33, 45, 56, 57, 60, 64, 76, 88, 89, 93, 97, 107, 108, 119, 120, 128, 137, 149, 150, 158, 166, 178, 179, 183, 187, 188, 194, 206, 207, 215, 222, 233, 234, 242, 249, 255, 256, 259, 260, 268, 275, 284, 285, 293, 300, 308, 309, 317, 329, 332, 333, 340, 347, 352, 355, 356, 362, 369, 374, 377, 378, 383, 390, 395, 399, 402, 409, 414, 418, and 421 have been amended herein. All of the pending claims 1 through 421 are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

1. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool; and
wetting a specific location of said at least one semiconductor component with said viscous material.
2. (Previously Presented) The method according to claim 1, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.
3. (Previously Presented) The method according to claim 2, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

Serial No. 09/942,323

4. (Previously Presented) The method according to claim 1, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

5. (Previously Presented) The method according to claim 1, wherein said aligning comprises aligning said at least one semiconductor component above said at least one upward facing opening.

6. (Original) The method according to claim 1, wherein said wetting comprises biasing said at least one semiconductor component downward proximate the viscous material in said viscous material pool such that said specific location of said at least one semiconductor component contacts said exposed surface of said viscous material.

7. (Original) The method according to claim 6, wherein said biasing comprises providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

8. (Previously Presented) The method according to claim 1, wherein said wetting comprises raising said viscous material pool upward proximate said at least one semiconductor component such that said specific location of said at least one semiconductor component contacts said exposed surface of said viscous material.

9. (Original) The method according to claim 1, further comprising pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

10. (Original) The method according to claim 1, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor component.

11. (Previously Presented) The method according to claim 10, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

12. (Currently Amended) The method according to claim 1, wherein said wetting comprises applying a layer of said viscous material having a thickness between 0.1 ~~to~~ and 15 mils on said specific location of said at least one semiconductor component.

13. (Previously Presented) The method according to claim 1, further comprising coating a surface of the at least one semiconductor component with a surfactant prior to said wetting a specific location of said at least one semiconductor component with said viscous material.

14. (Original) The method according to claim 1, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

15. (Previously Presented) The method according to claim 1, further comprising leveling said exposed surface of said viscous material prior to said wetting a specific location of said at least one semiconductor component.

Serial No. 09/942,323

16. (Original) The method according to claim 15, wherein said leveling comprises: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and flattening said initial exposed surface height to the desired exposed surface height.

17. (Original) The method according to claim 16, wherein said flattening comprises metering said initial exposed surface height with a wiper.

18. (Original) The method according to claim 16, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

19. (Original) The method according to claim 16, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

20. (Previously Presented) The method according to claim 1, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

21. (Previously Presented) The method according to claim 20, wherein said controlling the height of said exposed surface of said viscous material comprises: delivering said viscous material to said viscous material pool; providing said detection mechanism comprising a transmitter, a receiver, and a control signal; utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and providing said control signal to control said delivery of said viscous material to said viscous material pool.

Serial No. 09/942,323

22. (Previously Presented) The method according to claim 21, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

23. (Original) The method according to claim 21, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

24. (Currently Amended) The method according to claim 21, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

25. (Currently Amended) The method according to claim ~~20~~21, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

26. (Original) The method according to claim 1, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

27. (Original) The method according to claim 1, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

28. (Previously Presented) The method according to claim 27, further comprising attaching said at least one semiconductor component to a semiconductor die.

Serial No. 09/942,323

29. (Currently Amended) The method according to claim 1, wherein said wetting comprises applying said viscous material to said specific location ~~on~~of said at least one semiconductor component under at least a partially evacuated chamber.

30. (Previously Presented) The method according to claim 1, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

31. (Previously Presented) The method according to claim 1, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

32. (Original) The method according to claim 31, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

33. (Currently Amended) The method according to claim 32, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

34. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool including at least one reservoir containing viscous material, said viscous material pool defined by at least one peripheral edge having a height and configured such that an exposed surface of the viscous material is located in a precise location, said viscous material pool including at least one upward facing opening

Serial No. 09/942,323

exposing at least said exposed surface of said viscous material, said exposed surface of said viscous material having a height that extends above said height of said at least one peripheral edge;
leveling the exposed surface of said viscous material; and
coating only a specific portion of a surface of at least one semiconductor component with said viscous material.

35. (Previously Presented) The method according to claim 34, wherein said providing a viscous material pool including at least one reservoir containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

36. (Previously Presented) The method according to claim 35, wherein said providing a viscous material pool including at least one reservoir containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

37. (Previously Presented) The method according to claim 34, wherein said coating only a specific portion of a surface of at least one semiconductor component comprises applying said viscous material to at least one of a lead finger, bus bars, and a die attach paddle.

38. (Previously Presented) The method according to claim 34, wherein said coating only a specific portion of a surface of at least one semiconductor component comprises aligning said at least one semiconductor component over said at least one upward facing opening such that said exposed surface contacts only said specific portion of said surface of said at least one semiconductor component.

Serial No. 09/942,323

39. (Previously Presented) The method according to claim 34, wherein said coating comprises biasing said at least one semiconductor component downward proximate the viscous material in said viscous material pool such that said exposed surface of said viscous material contacts said specific portion of said surface of said at least one semiconductor component.

40. (Original) The method according to claim 39, wherein said biasing comprises providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material pool.

41. (Previously Presented) The method according to claim 34, wherein said coating comprises raising said viscous material pool upward proximate said at least one semiconductor component such that said exposed surface of said viscous material contacts said specific portion of said surface of said at least one semiconductor component.

42. (Original) The method according to claim 34, further comprising pumping said viscous material into said viscous material pool.

43. (Previously Presented) The method according to claim 34, wherein said coating comprises pumping said viscous material to a height above said viscous material pool, wherein said height of said viscous material is sufficient to contact only said specific portion of said surface of said at least one semiconductor component.

44. (Previously Presented) The method according to claim 43, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

Serial No. 09/942,323

45. (Currently Amended) The method according to claim 34, wherein said coating comprises applying a layer of said viscous material having a thickness between 0.1 ~~to~~and 15 mils to said specific portion of said surface of said at least one semiconductor component.

46. (Previously Presented) The method according to claim 34, further comprising coating said surface of the at least one semiconductor component with a surfactant prior to said coating said specific portion of said surface of said at least one semiconductor component with said viscous material.

47. (Original) The method according to claim 34, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

48. (Original) The method according to claim 34, wherein said leveling comprises: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and flattening said initial exposed surface height to the desired exposed surface height.

49. (Original) The method according to claim 48, wherein said flattening said initial exposed surface height comprises metering said initial exposed surface height with a wiper.

50. (Original) The method according to claim 48, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

51. (Original) The method according to claim 48, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

Serial No. 09/942,323

52. (Previously Presented) The method according to claim 48, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

53. (Previously Presented) The method according to claim 52, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material and;
providing said control signal to control said delivery of said viscous material.

54. (Previously Presented) The method according to claim 53, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said viscous material is achieved.

55. (Original) The method according to claim 53, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

56. (Currently Amended) The method according to claim ~~52~~53, wherein said controlling comprises providing said detection mechanism comprising a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

Serial No. 09/942,323

57. (Currently Amended) The method according to claim ~~52~~53, wherein said controlling comprises providing said detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from the ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of said ultrasonic sound wave and then generates the control signal.

58. (Original) The method according to claim 34, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

59. (Previously Presented) The method according to claim 58, further comprising attaching said at least one semiconductor component to a semiconductor die.

60. (Currently Amended) The method according to claim 34, wherein said coating comprises applying said viscous material to said specific portion ~~of~~on said surface on said at least one semiconductor component under at least a partially evacuated chamber.

61. (Previously Presented) The method according to claim 34, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

62. (Previously Presented) The method according to claim 34, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

Serial No. 09/942,323

63. (Original) The method according to claim 62, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

64. (Currently Amended) The method according to claim 63, wherein said coating comprises contacting said specific portion of said surface of said at least one semiconductor component with ~~the~~said viscous material over ~~the~~said curved-edge spillway.

65. (Original) The method according to claim 34, wherein said coating only a specific portion of a surface of at least one semiconductor component comprises coating a bottom surface of at least one lead finger with said viscous material.

66. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component above said at least one upward facing opening;
and
wetting a specific location of said at least one semiconductor component with said viscous material.

67. (Previously Presented) The method according to claim 66, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

Serial No. 09/942,323

68. (Previously Presented) The method according to claim 67, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

69. (Previously Presented) The method according to claim 66, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

70. (Previously Presented) The method according to claim 66, wherein said wetting comprises biasing said at least one semiconductor component downward proximate the viscous material in said viscous material pool such that said specific location of said at least one semiconductor component contacts said exposed surface of said viscous material.

71. (Previously Presented) The method according to claim 70, wherein said biasing comprises providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

72. (Previously Presented) The method according to claim 66, wherein said wetting comprises raising said viscous material pool upward proximate said at least one semiconductor component such that said specific location of said at least one semiconductor component contacts said exposed surface of said viscous material.

73. (Previously Presented) The method according to claim 66, further comprising pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

74. (Previously Presented) The method according to claim 66, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor component.

75. (Previously Presented) The method according to claim 74, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

76. (Currently Amended) The method according to claim 66, wherein said wetting comprises applying a layer of said viscous material having a thickness between 0.1 ~~to~~and 15 mils on said specific location of said at least one semiconductor component.

77. (Previously Presented) The method according to claim 66, further comprising coating a surface of the at least one semiconductor component with a surfactant prior to said wetting a specific location of said at least one semiconductor component with said viscous material.

78. (Previously Presented) The method according to claim 66, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

79. (Previously Presented) The method according to claim 66, further comprising leveling said exposed surface of said viscous material prior to said wetting a specific location of said at least one semiconductor component.

Serial No. 09/942,323

80. (Previously Presented) The method according to claim 79, wherein said leveling comprises:

providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

81. (Previously Presented) The method according to claim 80, wherein said flattening comprises metering said initial exposed surface height with a wiper.

82. (Previously Presented) The method according to claim 80, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

83. (Previously Presented) The method according to claim 80, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

84. (Previously Presented) The method according to claim 66, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

85. (Previously Presented) The method according to claim 84, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and

Serial No. 09/942,323

providing said control signal to control said delivery of said viscous material to said viscous material pool.

86. (Previously Presented) The method according to claim 85, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

87. (Previously Presented) The method according to claim 85, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

88. (Currently Amended) The method according to claim 85, wherein said providing ~~a~~said detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

89. (Currently Amended) The method according to claim ~~84~~85, wherein said controlling comprises providing ~~a~~said detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

90. (Previously Presented) The method according to claim 66, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

Serial No. 09/942,323

91. (Previously Presented) The method according to claim 66, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

92. (Previously Presented) The method according to claim 91, further comprising attaching said at least one semiconductor component to a semiconductor die.

93. (Currently Amended) The method according to claim 66, wherein said wetting comprises applying said viscous material to said specific location ~~on~~^{of} said at least one semiconductor component under at least a partially evacuated chamber.

94. (Previously Presented) The method according to claim 66, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

95. (Previously Presented) The method according to claim 66, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

96. (Previously Presented) The method according to claim 95, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

Serial No. 09/942,323

97. (Currently Amended) The method according to claim 96, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

98. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool; and
biasing said at least one semiconductor component downward proximate the viscous material in said viscous material pool such that a specific location of said at least one semiconductor component contacts said exposed surface of said viscous material.

99. (Previously Presented) The method according to claim 98, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

100. (Previously Presented) The method according to claim 99, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

101. (Previously Presented) The method according to claim 98, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

Serial No. 09/942,323

102. (Previously Presented) The method according to claim 98, wherein said biasing comprises providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

103. (Previously Presented) The method according to claim 98, further comprising raising said viscous material pool upward proximate said at least one semiconductor component such that said specific location of said at least one semiconductor component contacts said exposed surface of said viscous material.

104. (Previously Presented) The method according to claim 98, further comprising pumping said viscous material into said viscous material pool.

105. (Previously Presented) The method according to claim 98, further comprising pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor component.

106. (Previously Presented) The method according to claim 105, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

107. (Currently Amended) The method according to claim 98, wherein said biasing comprises applying a layer of said viscous material having a thickness between 0.1 ~~to~~and 15 mils on said specific location of said at least one semiconductor component.

Serial No. 09/942,323

108. (Currently Amended) The method according to claim 98, further comprising coating a surface of the at least one semiconductor component with a surfactant prior to said ~~wetting~~contacting a specific location of said at least one semiconductor component with said viscous material.

109. (Previously Presented) The method according to claim 98, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

110. (Previously Presented) The method according to claim 98, further comprising leveling said exposed surface of said viscous material prior to said biasing said at least one semiconductor component.

111. (Previously Presented) The method according to claim 110, wherein said leveling comprises:
providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

112. (Previously Presented) The method according to claim 111, wherein said flattening comprises metering said initial exposed surface height with a wiper.

113. (Previously Presented) The method according to claim 111, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

114. (Previously Presented) The method according to claim 111, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

115. (Previously Presented) The method according to claim 98, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

116. (Previously Presented) The method according to claim 115, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

117. (Previously Presented) The method according to claim 116, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

118. (Previously Presented) The method according to claim 116, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

Serial No. 09/942,323

119. (Currently Amended) The method according to claim 116, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

120. (Currently Amended) The method according to claim ~~115~~116, wherein said controlling comprises providing a detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

121. (Previously Presented) The method according to claim 98, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

122. (Previously Presented) The method according to claim 98, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

123. (Previously Presented) The method according to claim 122, further comprising attaching said at least one semiconductor component to a semiconductor die.

124. (Previously Presented) The method according to claim 98, wherein said biasing comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

Serial No. 09/942,323

125. (Previously Presented) The method according to claim 98, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

126. (Previously Presented) The method according to claim 98, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

127. (Previously Presented) The method according to claim 126, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

128. (Currently Amended) The method according to claim 127, wherein said ~~wetting~~contacting comp rises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

129. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool; and
wetting a specific location of said at least one semiconductor component with said viscous material by raising said viscous material pool upward proximate said at least one

Serial No. 09/942,323

semiconductor component such that said specific location of said at least one semiconductor component contacts said exposed surface of said viscous material.

130. (Previously Presented) The method according to claim 129, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

131. (Previously Presented) The method according to claim 130, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

132. (Previously Presented) The method according to claim 129, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

133. (Previously Presented) The method according to claim 129, wherein said wetting further comprises providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

134. (Previously Presented) The method according to claim 129, further comprising pumping said viscous material into said viscous material pool.

135. (Previously Presented) The method according to claim 129, wherein said wetting further comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor component.

Serial No. 09/942,323

136. (Previously Presented) The method according to claim 135, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

137. (Currently Amended) The method according to claim 129, wherein said wetting further comprises applying a layer of said viscous material having a thickness between 0.1 ~~to~~ and 15 mils on said specific location of said at least one semiconductor component.

138. (Previously Presented) The method according to claim 129, further comprising coating a surface of the at least one semiconductor component with a surfactant prior to said wetting a specific location of said at least one semiconductor component with said viscous material.

139. (Previously Presented) The method according to claim 129, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

140. (Previously Presented) The method according to claim 129, further comprising leveling said exposed surface of said viscous material prior to said wetting a specific location of said at least one semiconductor component.

141. (Previously Presented) The method according to claim 140, wherein said leveling comprises:
providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

Serial No. 09/942,323

142. (Previously Presented) The method according to claim 141, wherein said flattening comprises metering said initial exposed surface height with a wiper.

143. (Previously Presented) The method according to claim 141, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

144. (Previously Presented) The method according to claim 141, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

145. (Previously Presented) The method according to claim 129, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

146. (Previously Presented) The method according to claim 145, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

147. (Previously Presented) The method according to claim 146, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

Serial No. 09/942,323

148. (Previously Presented) The method according to claim 146, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

149. (Currently Amended) The method according to claim 146, wherein said providing ~~asaid~~ detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

150. (Currently Amended) The method according to claim ~~145~~146, wherein said controlling comprises providing ~~asaid~~ detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

151. (Previously Presented) The method according to claim 129, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

152. (Previously Presented) The method according to claim 129, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

153. (Previously Presented) The method according to claim 152, further comprising attaching said at least one semiconductor component to a semiconductor die.

Serial No. 09/942,323

154. (Previously Presented) The method according to claim 129, wherein said wetting further comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

155. (Previously Presented) The method according to claim 129, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

156. (Previously Presented) The method according to claim 129, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

157. (Previously Presented) The method according to claim 156, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

158. (Currently Amended) The method according to claim 157, wherein said wetting further comprises contacting said specific ~~portion~~ location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

159. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and

Serial No. 09/942,323

including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool; and
wetting a specific location of said at least one semiconductor component by pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor component.

160. (Previously Presented) The method according to claim 159, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

161. (Previously Presented) The method according to claim 160, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

162. (Previously Presented) The method according to claim 159, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

163. (Previously Presented) The method according to claim 159, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

164. (Previously Presented) The method according to claim 159, further comprising pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

165. (Previously Presented) The method according to claim 159, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

166. (Currently Amended) The method according to claim 159, wherein said wetting further comprises applying a layer of said viscous material having a thickness between 0.1 ~~to~~and 15 mils on said specific location of said at least one semiconductor component.

167. (Previously Presented) The method according to claim 159, further comprising coating a surface of the at least one semiconductor component with a surfactant prior to said wetting a specific location of said at least one semiconductor component with said viscous material.

168. (Previously Presented) The method according to claim 159, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

169. (Previously Presented) The method according to claim 159, further comprising leveling said exposed surface of said viscous material prior to said wetting a specific location of said at least one semiconductor component.

170. (Previously Presented) The method according to claim 169, wherein said leveling comprises:
providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

Serial No. 09/942,323

171. (Previously Presented) The method according to claim 170, wherein said flattening comprises metering said initial exposed surface height with a wiper.

172. (Previously Presented) The method according to claim 170, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

173. (Previously Presented) The method according to claim 170, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

174. (Previously Presented) The method according to claim 159, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

175. (Previously Presented) The method according to claim 174, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

176. (Previously Presented) The method according to claim 175, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

Serial No. 09/942,323

177. (Previously Presented) The method according to claim 175, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

178. (Currently Amended) The method according to claim 175, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

179. (Currently Amended) The method according to claim ~~174~~175, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

180. (Previously Presented) The method according to claim 159, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

181. (Previously Presented) The method according to claim 159, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

182. (Previously Added) The method according to claim 181, further comprising attaching said at least one semiconductor component to a semiconductor die.

Serial No. 09/942,323

183. (Currently Amended) The method according to claim 159, wherein said wetting further comprises applying said viscous material to said specific location ~~on~~of said at least one semiconductor component under at least a partially evacuated chamber.

184. (Previously Presented) The method according to claim 159, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

185. (Previously Presented) The method according to claim 159, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

186. (Previously Presented) The method according to claim 185, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

187. (Currently Amended) The method according to claim 186, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

188. (Currently Amended) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and

Serial No. 09/942,323

including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool; and
wetting a specific location of said at least one semiconductor component by applying a layer of said viscous material having a thickness between 0.1 ~~to~~ and 15 mils on said specific location of said at least one semiconductor component.

189. (Previously Presented) The method according to claim 188, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

190. (Previously Presented) The method according to claim 189, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

191. (Previously Presented) The method according to claim 188, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

192. (Previously Presented) The method according to claim 188, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

193. (Previously Presented) The method according to claim 188, further comprising pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

194. (Currently Amended) The method according to claim 188, further comprising pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component by~~component, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

195. (Previously Presented) The method according to claim 188, further comprising coating a surface of the at least one semiconductor component with a surfactant prior to said wetting a specific location of said at least one semiconductor component with said viscous material.

196. (Previously Presented) The method according to claim 188, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

197. (Previously Presented) The method according to claim 188, further comprising leveling said exposed surface of said viscous material prior to said wetting a specific location of said at least one semiconductor component.

198. (Previously Presented) The method according to claim 197, wherein said leveling comprises:
providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

199. (Previously Presented) The method according to claim 198, wherein said flattening comprises metering said initial exposed surface height with a wiper.

Serial No. 09/942,323

200. (Previously Presented) The method according to claim 198, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

201. (Previously Presented) The method according to claim 198, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

202. (Previously Presented) The method according to claim 188, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

203. (Previously Presented) The method according to claim 202, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

204. (Previously Presented) The method according to claim 203, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

205. (Previously Presented) The method according to claim 203, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

Serial No. 09/942,323

206. (Currently Amended) The method according to claim 203, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

207. (Currently Amended) The method according to claim ~~202~~203, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

208. (Previously Presented) The method according to claim 188, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

209. (Previously Presented) The method according to claim 188, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

210. (Previously Presented) The method according to claim 209, further comprising attaching said at least one semiconductor component to a semiconductor die.

211. (Previously Presented) The method according to claim 188, wherein said wetting further comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

Serial No. 09/942,323

212. (Previously Presented) The method according to claim 188, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

213. (Previously Presented) The method according to claim 188, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

214. (Previously Presented) The method according to claim 213, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

215. (Currently Amended) The method according to claim 214, wherein said wetting further comprises contacting said ~~specific portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

216. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool;
coating a surface of the at least one semiconductor component with a surfactant; and

Serial No. 09/942,323

wetting a specific location of said at least one semiconductor component with said viscous material after said coating said surface.

217. (Previously Presented) The method according to claim 216, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

218. (Previously Presented) The method according to claim 217, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

219. (Previously Presented) The method according to claim 216, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

220. (Previously Presented) The method according to claim 216, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

221. (Previously Presented) The method according to claim 216, further comprising pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

222. (Currently Amended) The method according to claim 216, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component by component~~, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

223. (Previously Presented) The method according to claim 216, further comprising adding an adhesion promoter to said viscous material, wherein said adhesion promoter is selected from the group consisting of silane, siloxane, and polyimide siloxane.

224. (Previously Presented) The method according to claim 216, further comprising leveling said exposed surface of said viscous material prior to said wetting a specific location of said at least one semiconductor component.

225. (Previously Presented) The method according to claim 224, wherein said leveling comprises:
providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

226. (Previously Presented) The method according to claim 225, wherein said flattening comprises metering said initial exposed surface height with a wiper.

227. (Previously Presented) The method according to claim 225, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

228. (Previously Presented) The method according to claim 225, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

229. (Previously Presented) The method according to claim 216, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

230. (Previously Presented) The method according to claim 229, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

231. (Previously Presented) The method according to claim 230, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

232. (Previously Presented) The method according to claim 230, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

Serial No. 09/942,323

233. (Currently Amended) The method according to claim 230, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

234. (Currently Amended) The method according to claim ~~232~~230, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

235. (Previously Presented) The method according to claim 216, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

236. (Previously Presented) The method according to claim 216, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

237. (Previously Presented) The method according to claim 236, further comprising attaching said at least one semiconductor component to a semiconductor die.

Serial No. 09/942,323

238. (Previously Presented) The method according to claim 216, wherein said wetting comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

239. (Previously Presented) The method according to claim 216, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

240. (Previously Presented) The method according to claim 216, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

241. (Previously Presented) The method according to claim 240, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

242. (Currently Amended) The method according to claim 241, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

243. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and

Serial No. 09/942,323

including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
adding an adhesion promoter to said viscous material, said adhesion promoter selected from the group consisting of silane, siloxane, and polyimide siloxane;
aligning at least one semiconductor component over said viscous material pool; and
wetting a specific location of said at least one semiconductor component with said viscous material.

244. (Previously Presented) The method according to claim 243, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

245. (Previously Presented) The method according to claim 244, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

246. (Previously Presented) The method according to claim 243, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

247. (Previously Presented) The method according to claim 243, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

248. (Previously Presented) The method according to claim 243, further comprising pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

249. (Currently Amended) The method according to claim 243, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component~~ by component, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

250. (Previously Presented) The method according to claim 243, further comprising leveling said exposed surface of said viscous material prior to said wetting a specific location of said at least one semiconductor component.

251. (Previously Presented) The method according to claim 250, wherein said leveling comprises:
providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

252. (Previously Presented) The method according to claim 251, wherein said flattening comprises metering said initial exposed surface height with a wiper.

253. (Previously Presented) The method according to claim 251, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

254. (Previously Presented) The method according to claim 251, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

Serial No. 09/942,323

255. (Currently Amended) The method according to claim ~~243~~243, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

256. (Currently Amended) The method according to claim ~~253~~255, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

257. (Previously Presented) The method according to claim 256, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

258. (Previously Presented) The method according to claim 256, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

259. (Currently Amended) The method according to claim 256, wherein said providing ~~asaid~~ detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

Serial No. 09/942,323

260. (Currently Amended) The method according to claim 256, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

261. (Previously Presented) The method according to claim 243, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

262. (Previously Presented) The method according to claim 243, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

263. (Previously Presented) The method according to claim 243, further comprising attaching said at least one semiconductor component to a semiconductor die.

264. (Previously Presented) The method according to claim 243, wherein said wetting comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

265. (Previously Presented) The method according to claim 243, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

Serial No. 09/942,323

266. (Previously Presented) The method according to claim 243, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

267. (Previously Presented) The method according to claim 266, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

268. (Currently Amended) The method according to claim 267, wherein said wetting comprises contacting said ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

269. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool;
leveling said exposed surface of said viscous material; and
wetting a specific location of said at least one semiconductor component with said viscous material after said leveling said exposed surface.

270. (Previously Presented) The method according to claim 269, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

Serial No. 09/942,323

271. (Previously Presented) The method according to claim 270, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

272. (Previously Presented) The method according to claim 269, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

273. (Previously Presented) The method according to claim 269, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

274. (Previously Presented) The method according to claim 269, further comprising pumping said viscous material into said viscous material pool.

275. (Currently Amended) The method according to claim 269, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component by component~~, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

Serial No. 09/942,323

276. (Previously Presented) The method according to claim 269, wherein said leveling comprises:
providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

277. (Previously Presented) The method according to claim 276, wherein said flattening comprises metering said initial exposed surface height with a wiper.

278. (Previously Presented) The method according to claim 276, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

279. (Previously Presented) The method according to claim 276, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

280. (Previously Presented) The method according to claim 269, further comprising controlling the height of said exposed surface of said viscous material using a detection mechanism.

281. (Previously Presented) The method according to claim 280, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and

Serial No. 09/942,323

providing said control signal to control said delivery of said viscous material to said viscous material pool.

282. (Previously Presented) The method according to claim 281, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

283. (Previously Presented) The method according to claim 281, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

284. (Currently Amended) The method according to claim 281, wherein said providing said detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

285. (Currently Amended) The method according to claim 281, wherein said controlling comprises providing said detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

286. (Previously Presented) The method according to claim 269, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

Serial No. 09/942,323

287. (Previously Presented) The method according to claim 269, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

288. (Previously Presented) The method according to claim 287, further comprising attaching said at least one semiconductor component to a semiconductor die.

289. (Previously Presented) The method according to claim 269, wherein said wetting comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

290. (Previously Presented) The method according to claim 269, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

291. (Previously Presented) The method according to claim 269, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

292. (Previously Presented) The method according to claim 291, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

Serial No. 09/942,323

293. (Currently Amended) The method according to claim 292, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

294. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool;
controlling the height of said exposed surface of said viscous material using a detection mechanism; and
wetting a specific location of said at least one semiconductor component with said viscous material.

295. (Previously Presented) The method according to claim 294, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

296. (Previously Presented) The method according to claim 295, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

297. (Previously Presented) The method according to claim 294, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

Serial No. 09/942,323

298. (Previously Presented) The method according to claim 294, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

299. (Previously Presented) The method according to claim 294, further comprising pumping said viscous material into said viscous material pool.

300. (Currently Amended) The method according to claim 294, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component~~ by component, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

301. (Previously Presented) The method according to claim 294, further comprising: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and flattening said initial exposed surface height to the desired exposed surface height.

302. (Previously Presented) The method according to claim 301, wherein said flattening comprises metering said initial exposed surface height with a wiper.

303. (Previously Presented) The method according to claim 301, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

304. (Previously Presented) The method according to claim 301, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

305. (Previously Presented) The method according to claim 294, wherein said controlling the height of said exposed surface of said viscous material comprises:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

306. (Previously Presented) The method according to claim 305, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

307. (Previously Presented) The method according to claim 305, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

308. (Currently Amended) The method according to claim 305, wherein said providing said detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

Serial No. 09/942,323

309. (Currently Amended) The method according to claim ~~294~~305, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

310. (Previously Presented) The method according to claim 294, wherein said providing a viscous material pool comprises providing said viscous material pool including multiple reservoirs housing said viscous material.

311. (Previously Presented) The method according to claim 294, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

312. (Previously Presented) The method according to claim 311, further comprising attaching said at least one semiconductor component to a semiconductor die.

313. (Previously Presented) The method according to claim 294, wherein said wetting comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

314. (Previously Presented) The method according to claim 294, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

Serial No. 09/942,323

315. (Previously Presented) The method according to claim 294, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

316. (Previously Presented) The method according to claim 315, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

317. (Currently Amended) The method according to claim 316, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

318. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool including multiple reservoirs housing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool; and
wetting a specific location of said at least one semiconductor component with said viscous material.

319. (Previously Presented) The method according to claim 318, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

Serial No. 09/942,323

320. (Previously Presented) The method according to claim 318, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

321. (Previously Presented) The method according to claim 318, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

322. (Previously Presented) The method according to claim 318, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

323. (Previously Presented) The method according to claim 318, further comprising pumping said viscous material into said viscous material pool.

324. (Previously Presented) The method according to claim 318, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor component by pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

325. (Previously Presented) The method according to claim 318, further comprising: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and flattening said initial exposed surface height to the desired exposed surface height.

Serial No. 09/942,323

326. (Previously Presented) The method according to claim 325, wherein said flattening comprises metering said initial exposed surface height with a wiper.

327. (Previously Presented) The method according to claim 325, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

328. (Previously Presented) The method according to claim 325, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

329. (Currently Amended) The method according to claim 318, further comprising controlling the height of said exposed surface of said viscous material by:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

330. (Previously Presented) The method according to claim 329, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

331. (Previously Presented) The method according to claim 329, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

Serial No. 09/942,323

332. (Currently Amended) The method according to claim 329, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

333. (Currently Amended) The method according to claim 329, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

334. (Previously Presented) The method according to claim 318, further comprising feeding said at least one semiconductor component through a curing oven to set the viscous material.

335. (Previously Presented) The method according to claim 334, further comprising attaching said at least one semiconductor component to a semiconductor die.

336. (Previously Presented) The method according to claim 318, wherein said wetting comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

337. (Previously Presented) The method according to claim 318, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

Serial No. 09/942,323

338. (Previously Presented) The method according to claim 318, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

339. (Previously Presented) The method according to claim 338, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

340. (Currently Amended) The method according to claim 339, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

341. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool;
wetting a specific location of said at least one semiconductor component with said viscous material; and
feeding said at least one semiconductor component through a curing oven to set the viscous material.

342. (Previously Presented) The method according to claim 341, wherein said providing a viscous material pool containing viscous material comprises providing said viscous

Serial No. 09/942,323

material pool containing adhesive or polyimide.

343. (Previously Presented) The method according to claim 342, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

344. (Previously Presented) The method according to claim 341, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

345. (Previously Presented) The method according to claim 341, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

346. (Previously Presented) The method according to claim 341, further comprising pumping said viscous material into said viscous material pool.

347. (Currently Amended) The method according to claim 341, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component-bycomponent~~, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

348. (Previously Presented) The method according to claim 341, further comprising: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired

Serial No. 09/942,323

exposed surface height; and
flattening said initial exposed surface height to the desired exposed surface height.

349. (Previously Presented) The method according to claim 348, wherein said flattening comprises metering said initial exposed surface height with a wiper.

350. (Previously Presented) The method according to claim 348, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

351. (Previously Presented) The method according to claim 348, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

352. (Currently Amended) The method according to claim 341, further comprising controlling the height of said exposed surface of said viscous material by:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

353. (Previously Presented) The method according to claim 352, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

354. (Previously Presented) The method according to claim 352, wherein said

Serial No. 09/942,323

providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

355. (Currently Amended) The method according to claim 352, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

356. (Currently Amended) The method according to claim 352, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

357. (Previously Presented) The method according to claim 341, further comprising attaching said at least one semiconductor component to a semiconductor die.

358. (Previously Presented) The method according to claim 341, wherein said wetting comprises applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

359. (Previously Presented) The method according to claim 341, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

Serial No. 09/942,323

360. (Previously Presented) The method according to claim 341, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

361. (Previously Presented) The method according to claim 360, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

362. (Currently Amended) The method according to claim 361, wherein said wetting comprises contacting said specific ~~portion~~ location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

363. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool; and
wetting a specific location of said at least one semiconductor component with said viscous material by applying said viscous material to said specific location on said at least one semiconductor component under at least a partially evacuated chamber.

364. (Previously Presented) The method according to claim 363, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

Serial No. 09/942,323

365. (Previously Presented) The method according to claim 364, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

366. (Previously Presented) The method according to claim 363, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

367. (Previously Presented) The method according to claim 363, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

368. (Previously Presented) The method according to claim 363, further comprising pumping said viscous material into said viscous material pool.

369. (Currently Amended) The method according to claim 363, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component by component~~, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

370. (Previously Presented) The method according to claim 363, further comprising: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and flattening said initial exposed surface height to the desired exposed surface height.

Serial No. 09/942,323

371. (Previously Presented) The method according to claim 370, wherein said flattening comprises metering said initial exposed surface height with a wiper.

372. (Previously Presented) The method according to claim 370, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

373. (Previously Presented) The method according to claim 370, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

374. (Currently Amended) The method according to claim 363, further comprising controlling the height of said exposed surface of said viscous material by:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

375. (Previously Presented) The method according to claim 374, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

376. (Previously Presented) The method according to claim 374, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

Serial No. 09/942,323

377. (Currently Amended) The method according to claim 374, wherein said providing asaid detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

378. (Currently Amended) The method according to claim 374, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

379. (Previously Presented) The method according to claim 363, further comprising attaching said at least one semiconductor component to a semiconductor die.

380. (Previously Presented) The method according to claim 363, wherein said providing a viscous material pool comprises providing said viscous material pool including an inlet, an outlet and a plate-type reservoir, wherein said at least one upward facing opening exposes said plate-type reservoir and wherein said viscous material flows from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate.

381. (Previously Presented) The method according to claim 363, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

Serial No. 09/942,323

382. (Previously Presented) The method according to claim 381, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

383. (Currently Amended) The method according to claim 382, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

384. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool including an inlet, an outlet and a plate-type reservoir containing viscous material, said viscous material pool shaped such that an exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said plate-type reservoir and said exposed surface of said viscous material;
aligning at least one semiconductor component over said viscous material pool;
allowing said viscous material to flow from said inlet across a plate and into said outlet such that a thin layer of said viscous material is delivered across said plate; and
wetting a specific location of said at least one semiconductor component with said viscous material.

385. (Previously Presented) The method according to claim 384, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

386. (Previously Presented) The method according to claim 385, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics,

Serial No. 09/942,323

thermoset resins, flowable pastes, and B-stage adhesive materials.

387. (Previously Presented) The method according to claim 384, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

388. (Previously Presented) The method according to claim 384, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

389. (Previously Presented) The method according to claim 384, further comprising pumping said viscous material into said viscous material pool.

390. (Currently Amended) The method according to claim 384, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor component ~~by component~~, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

391. (Previously Presented) The method according to claim 384, further comprising: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and flattening said initial exposed surface height to the desired exposed surface height.

Serial No. 09/942,323

392. (Previously Presented) The method according to claim 391, wherein said flattening comprises metering said initial exposed surface height with a wiper.

393. (Previously Presented) The method according to claim 391, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

394. (Previously Presented) The method according to claim 391, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

395. (Currently Amended) The method according to claim 384, further comprising controlling the height of said exposed surface of said viscous material by:
delivering said viscous material to said viscous material pool;
providing said detection mechanism comprising a transmitter, a receiver, and a control signal;
utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

396. (Previously Presented) The method according to claim 395, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

397. (Previously Presented) The method according to claim 395, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

Serial No. 09/942,323

398. (Previously Presented) The method according to claim 395, wherein said providing a detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

399. (Currently Amended) The method according to claim 395, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

400. (Previously Presented) The method according to claim 384, wherein said providing a viscous material pool comprises providing said viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, wherein said at least one upward facing opening exposes said curved-edge spillway.

401. (Previously Presented) The method according to claim 400, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

402. (Currently Amended) The method according to claim 401, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.

403. (Previously Presented) A method for applying viscous material to at least one semiconductor component, said method comprising:
providing a viscous material pool including a first chamber, a curved-edge spillway and a spill chamber, said viscous material pool containing viscous material and shaped such that an

Serial No. 09/942,323

exposed surface of the viscous material is located in a precise location and including at least one upward facing opening, said at least one upward facing opening exposing at least said curved-edge spillway and said exposed surface of said viscous material; aligning at least one semiconductor component over said viscous material pool; and wetting a specific location of said at least one semiconductor component with said viscous material.

404. (Previously Presented) The method according to claim 403, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing adhesive or polyimide.

405. (Previously Presented) The method according to claim 404, wherein said providing a viscous material pool containing viscous material comprises providing said viscous material pool containing said adhesive selected from the group consisting of thermoplastics, thermoset resins, flowable pastes, and B-stage adhesive materials.

406 (Previously Presented) The method according to claim 403, wherein said aligning at least one semiconductor component comprises placing at least one of a lead finger, bus bars, and a die attach paddle above said viscous material pool.

407. (Previously Presented) The method according to claim 403, further comprising providing at least one of a hydraulic biasing mechanism, pneumatic biasing mechanism, and electrically-powered biasing mechanism configured to place said at least one semiconductor component proximate said viscous material.

408. (Previously Presented) The method according to claim 403, further comprising pumping said viscous material into said viscous material pool.

Serial No. 09/942,323

409. (Currently Amended) The method according to claim 403, wherein said wetting comprises pumping said viscous material to a height above said viscous material pool sufficient to contact said specific location of said at least one semiconductor ~~component-bycomponent~~, wherein said pumping comprises creating a moving wave of said viscous material traveling across said viscous material pool.

410. (Previously Presented) The method according to claim 403, further comprising: providing said viscous material to said viscous material pool such that said exposed surface of said viscous material reaches an initial exposed surface height higher than a desired exposed surface height; and flattening said initial exposed surface height to the desired exposed surface height.

411. (Previously Presented) The method according to claim 410, wherein said flattening comprises metering said initial exposed surface height with a wiper.

412. (Previously Presented) The method according to claim 410, wherein said providing said viscous material comprises pumping said viscous material into said viscous material pool.

413. (Previously Presented) The method according to claim 410, wherein said flattening said initial exposed surface height comprises drawing back said viscous material to flatten said exposed surface of said viscous material.

414. (Currently Amended) The method according to claim 403, further comprising controlling the height of said exposed surface of said viscous material comprises: delivering said viscous material to said viscous material pool; providing said detection mechanism comprising a transmitter, a receiver, and a control signal;

Serial No. 09/942,323

utilizing said transmitter and said receiver to determine the height of the exposed surface of said viscous material; and
providing said control signal to control said delivery of said viscous material to said viscous material pool.

415. (Previously Presented) The method according to claim 414, wherein said providing said control signal comprises triggering a pump to stop said delivering said viscous material to said viscous material pool when a desired height of said exposed surface is achieved.

416. (Previously Presented) The method according to claim 414, wherein said providing said control signal comprises triggering a valve to shut to prevent additional viscous material from entering said viscous material pool.

417. (Previously Presented) The method according to claim 414, wherein said providing a detection mechanism comprises providing a laser transmitter, wherein a light beam from said laser transmitter is altered by the exposed surface and the receiver detects the alteration of said light beam and then generates said control signal.

418. (Currently Amended) The method according to claim 414, wherein said controlling comprises providing asaid detection mechanism comprising an ultrasonic transmitter, wherein an ultrasonic sound wave from said ultrasonic transmitter is altered by the exposed surface and the receiver detects the alteration of the ultrasonic sound wave and then generates the control signal.

419. (Previously Presented) The method according to claim 403, further comprising attaching said at least one semiconductor component to a semiconductor die.

Serial No. 09/942,323

420. (Previously Presented) The method according to claim 403, further comprising pumping said viscous material into said first chamber and over said curved-edge spillway at a constant rate.

421. (Currently Amended) The method according to claim 420, wherein said wetting comprises contacting said specific ~~portion~~location of said at least one semiconductor component with the viscous material over the curved-edge spillway.